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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

COOLEY, CHARLES E

ART UNIT PAPER NUMBER

1723

DATE MAILED: 09/29/2003

14

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/873,209

Applicant(s)

ENGEL, DAVID J.

Examiner

Charles E. Cooley

Art Unit

1723

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 18 July 2003 and 15 August 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-7,9,11-19 and 23-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7,9,11-19 and 23-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

Art Unit: 1723

## OFFICE ACTION

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 18 JUL 2003 has been entered.

### ***Specification***

2. The abstract and title are acceptable.

### ***Claim Rejections - 35 U.S.C. § 112, first paragraph***

3. The following is a quotation of the first paragraph of 35 U.S.C. § 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. The specification is objected to under 35 U.S.C. § 112, first paragraph, as failing to provide an adequate written description of the invention and failing to adequately

Art Unit: 1723

teach how to make and/or use the invention, i.e., failing to provide an enabling disclosure.

The specification is deemed inadequate in describing the invention because the structural cooperative relationship between the presently claimed coolant coil line and the other elements of the seal assembly is not adequately set forth and not enabled by the disclosure. The seal member 29 about which the coolant coil line 30 is wrapped rotates yet the coolant coil line is disclosed as being "mounted to the seal housing" (page 7, first full paragraph). Accordingly, it is assumed the coolant coil line 30 is fixedly mounted to the stationary seal housing 22. It is therefore unclear how the coolant coil line dissipates heat from the rotating seal member 29. Does the coolant coil line cool the chamber in which the seal member 29 is located or does the external rotating surface of the seal member 29 physically contact the inner surface of the stationary coolant coil line 30 to transfer heat thereto via conduction? The specification cannot answer these concerns since the specification is silent on the structural relationship between the coil and the rotating seal and the drawing Figures are not considered to resolve the issue either. Furthermore, it is unclear how the heat exchange fluid enters and exits the coil 30 through the seal housing to provide the heat exchange function through the coil 30. Hence, in view of the invention as is now claimed, the manner in which the coolant coil 30 coacts with the seal member 29 and seal housing 22 to provide the function of cooling the rotating seal member 29 is not considered to meet the adequate written description requirement and thus fails to

Art Unit: 1723

adequately teach how to make and/or use the invention, i.e., fails to provide an enabling disclosure.

5. Claims 1-7, 9, 11-19, and 23-27 are rejected under 35 U.S.C. § 112, first paragraph, for the reasons set forth in the objection to the specification.

***Claim Rejections - 35 U.S.C. § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 6, 7, 11, 16, 17, 18, 23 and 24 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Rubin (US 3,606,260) in view of Bonhomme (US 4,587,076).

The patent to Rubin discloses in Fig. 2 an assembly 25 in cartridge form (col 6, lines 61-63) including a support or supporting means 26; a sealing assembly or sealing means (Fig. 2) or 150 (see the alternate embodiment 150 of the seal in Fig. 4) mounted at an axial location relative to a shaft 23; the sealing assembly of Fig.2 or Fig. 4 having a rotating seal element or means 65, 71 that surrounds the shaft 23 and is positioned between a first stationary sealing ring or means 64 and a second stationary sealing ring

Art Unit: 1723

or means 70; a first bearing or first bearing means 75 mounted to the support 26 that surrounds and supports the shaft 23 at a first axial location thereof; a second bearing or second bearing means 78 mounted to the support 26 that surrounds and supports the shaft 23 at a second axial location thereof; the support 26 including a first support portion 26b that supports the sealing assembly and a second support portion 26a that supports the first and second bearings 75, 78; the first support portion 26b comprising a base 26b attachable to the vessel wall 42; the second support portion 26a comprises a housing 26a attached to the base 26b which housing 26b supports the first and second bearings (Fig. 2); the first stationary sealing ring 64 contacting the rotating seal element 65, 71 at 65a; the second stationary sealing ring 70 contacting the rotating seal element 65, 71 at 70a; the seal element 65, 71 adapted for use with lubricating material (col. 9, lines 39-69). Rubin does not disclose the recited coolant coil line for the sealing assembly. Bonhomme (US 4,587,076) discloses a sealing assembly 26, 26 for a rotating shaft 27 disposed in a stationary housing 21. A coolant coil line 29 is mounted to the sealing assembly and wrapped around the sealing assembly 26, 26 as seen in Figure 2. It would have been obvious to one having ordinary skill in the art, at the time applicant's invention was made, to have provided the sealing assembly of Rubin with a coolant coil line as taught by Bonhomme for the purpose of dissipating heat from the sealing assembly (col. 3, lines 50-54).

Art Unit: 1723

8. Claims 9 and 19 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Rubin (US 3,606,260) in view of Bonhomme (US 4,587,076) as applied to claims 1 and 11 above, and further in view of Blakley et al. (US 5,568,975).

Rubin (US 3,606,260) in view of Bonhomme (US 4,587,076) does not disclose the inner bearing housing. Blakley et al. (USP 5,568,975) discloses a shaft 12; axially extending bearing 20 and an inner bearing housing 14 that surrounds a portion of the shaft 12 and is mounted to the bearing 20. It would have been obvious to one having ordinary skill in the art, at the time applicant's invention was made, to have provided the assembly of Rubin (US 3,606,260) in view of Bonhomme (US 4,587,076) with an inner bearing housing as disclosed by Blakley et al. for the purpose of providing the shaft with a wear sleeve to protect the shaft (Col. 4, lines 8-22).

9. Claims 2-5, 12-15, and 25-27 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Rubin (US 3,606,260) in view of Bonhomme (US 4,587,076) as applied to claims 1 and 11 above, and further in view of Armitage (US 2,332,684).

Rubin (US 3,606,260) in view of Bonhomme (US 4,587,076) discloses that the assembly and thus the elements thereof (such as the sealing assembly and bearings) are removable (col. 9, line 70 through col. 10, line 46) but does not disclose the bearings in the form of the recited tapered roller bearings. The patent to Armitage discloses an assembly for supporting a shaft 10 which employs axially spaced tapered rollers bearings 16 and 23 in the recited configuration as seen in Fig. 1. It would have been obvious to one having ordinary skill in the art, at the time applicant's invention was

Art Unit: 1723

made, to have substituted the bearings of Rubin (US 3,606,260) in view of Bonhomme (US 4,587,076) with tapered rollers bearings as disclosed by Armitage for the purpose of supporting the shaft in a rigid fashion and to resist both axial and radial loads (page 2, col. 1, lines 22-25).

10. Claims 2-5, 12-15, and 25-27 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Rubin (US 3,606,260) in view of Bonhomme (US 4,587,076) as applied to claims 1 and 11 above, and further in view of Kapaan et al. (US 5,667,313).

Rubin (US 3,606,260) in view of Bonhomme (US 4,587,076) discloses that the assembly and thus the elements thereof (such as the sealing assembly and bearings) are removable (col. 9, line 70 through col. 10, line 46) but does not disclose the bearings in the form of the recited tapered roller bearings. The patent to Kapaan et al. discloses an assembly for supporting a shaft 18 which employs axially spaced tapered rollers bearings 2 in the recited configuration as seen in Fig. 1. It would have been obvious to one having ordinary skill in the art, at the time applicant's invention was made, to have substituted the bearings of Rubin (US 3,606,260) in view of Bonhomme (US 4,587,076) with tapered rollers bearings as disclosed by Kapaan et al. for the purpose of enabling such coaxial bearings to be placed under a certain initial load (col. 1, lines 5-8).

11. Claims 2-5, 12-15, and 25-27 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Rubin (US 3,606,260) in view of Bonhomme (US 4,587,076) as applied to claims 1 and 11 above, and further in view of Gradu (US 6,293,704).



Art Unit: 1723

Rubin (US 3,606,260) in view of Bonhomme (US 4,587,076) discloses that the assembly and thus the elements thereof (such as the sealing assembly and bearings) are removable (col. 9, line 70 through col. 10, line 46) but does not disclose the bearings in the form of the recited tapered roller bearings. The patent to Gradu discloses an assembly for supporting a shaft S which employs axially spaced tapered rollers bearings 36 in the recited configuration as seen in Fig. 1. It would have been obvious to one having ordinary skill in the art, at the time applicant's invention was made, to have substituted the bearings of Rubin (US 3,606,260) in view of Bonhomme (US 4,587,076) with tapered rollers bearings as disclosed by Gradu for the purpose of enabling the preload of the bearings to eliminate radial and axial play in the bearings (col. 1, lines 42-45).

12. Claims 2-5, 12-15, and 25-27 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Rubin (US 3,606,260) in view of Bonhomme (US 4,587,076) as applied to claims 1 and 11 above, and further in view of Rode (US 6,327,773).

Rubin (US 3,606,260) in view of Bonhomme (US 4,587,076) discloses that the assembly and thus the elements thereof (such as the sealing assembly and bearings) are removable (col. 9, line 70 through col. 10, line 46) but does not disclose the bearings in the form of the recited tapered roller bearings. The patent to Rode discloses an assembly for supporting a shaft 106 which employs axially spaced tapered rollers bearings 116, 126 in the recited configuration as seen in Fig. 1. It would have been obvious to one having ordinary skill in the art, at the time applicant's invention was

Art Unit: 1723

made, to have substituted the bearings of Rubin (US 3,606,260) in view of Bonhomme (US 4,587,076) with tapered rollers bearings as disclosed by Rode for the purpose of providing axial and radial support within the bearing assembly (col. 9, lines 1-3).

13. Claims 2-5, 12-15, and 25-27 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Rubin (US 3,606,260) in view of Bonhomme (US 4,587,076) as applied to claims 1 and 11 above, and further in view of Casey (US 5,876,127).

Rubin (US 3,606,260) in view of Bonhomme (US 4,587,076) discloses that the assembly and thus the elements thereof (such as the sealing assembly and bearings) are removable (col. 9, line 70 through col. 10, line 46) but does not disclose the bearings in the form of the recited tapered roller bearings. The patent to Casey discloses an assembly for supporting a shaft 10 which employs axially spaced bearings 32 in the recited configuration as seen in Fig. 1. The bearings 32 may be ball bearings or rollers. Since Casey suggests the equivalence of ball bearings and roller bearings, it would have been obvious to one having ordinary skill in the art, at the time applicant's invention was made, to have substituted the ball bearings of Rubin (US 3,606,260) in view of Bonhomme (US 4,587,076) with tapered rollers bearings as disclosed by Casey or since the use of a tapered bearing assembly is advantageous for applications requiring the use of shafts made of hardened material or for application where the direction of shaft rotation is expected to reverse (col. 2, lines 4-7 and col. 3, lines 31-35).

Art Unit: 1723

***Response to Amendment***

14. Applicant's arguments with respect to the pending claims have been considered but are deemed to be moot in view of the new grounds of rejection necessitated by the amendments to claims.

***Conclusion***

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The cited prior art teaches cooling means for sealing assemblies.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Charles Cooley whose telephone number is ☎ (703) 308-0112.

17. Any inquiry of a general nature or relating to the status of this application should be directed to the Technology Center 1700 receptionist whose telephone number is ☎ (703) 308-0651.

Dated: 16 September 2003



**Charles Cooley  
Primary Examiner  
Art Unit 1723**